

## **SECTION C – INFRASTRUCTURE & OPERATION**

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### **Attachment C1: Operational Information Requirements**

- **Outline Description of the Treatment Process at Carlanstown WWTP & Agglomeration**
- **Drawing No. 5270-2788**
- **Drawing No. 5270-2789**

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## OUTLINE DESCRIPTION OF THE TREATMENT PROCESS FOR CARLANSTOWN

### WASTE WATER TREATMENT PLANT AND AGGLOMERATION

#### **1.0 EXISTING PLANT**

Carlanstown Waste Water Treatment Plant (WWTP) is located to the south of the village of Carlanstown. The plant was commissioned in 2002, treating municipal waste water from the village. The drainage network serving Carlanstown discharges by gravity to the sewage treatment plant.

As stated in Attachment B.9(ii), the current waste water treatment plant at Carlanstown was commissioned during 2002. The existing plant was originally designed for a notional capacity of 600 P.E., however the process tanks (aeration basin and final clarifier) are sized such that the actual capacity of the plant is significantly higher. Preliminary process design checks were undertaken using 'as constructed' dimensions combined with site specific influent flow and load data, which has revealed that biological loadings of up to at least 820 P.E. will be easily accommodated within the various design constraints (e.g. required retention times and upward flow velocities, etc.) at the current Carlanstown WWTP.

The treatment process is based on the extended aeration (activated sludge) process.

Treated effluent from the works is discharged to the Moynalty River, via a 225mm diameter gravity main.

The existing treatment works currently consists of the following units: -

- Inlet chamber with inlet pumps
- Inflow flow meter
- 'Agisac' Screen
- Aeration unit and clarifier
- Submersible pump for sludge return and wasting
- Sludge holding tank
- Ferric sulphate dosing tank
- Gravity outfall to the river
- Office / Control building
- New anoxic tank (under construction – not yet commissioned)

#### ***Inlet to Works, Storm Water Overflow and Preliminary Treatment***

The existing waste water collection and disposal system discharges directly by gravity (in 225mm diameter sewer) to an inlet chamber equipped with 2 no. forward feed-type submersible pumps. The inlet chamber has an approximate effective capacity of 15m<sup>3</sup>. The



foul influent is then pumped to the 'Agisac chamber'. Here, the influent receives preliminary screening prior to entering aeration process.

The inlet sump has an emergency storm water overflow facility, which bypasses the plant. Excess storm water overflows the sump in a 225mm diameter pipe around the plant, intercepted by the treated effluent outfall manhole. At this point the storm water and final effluent combine and then flow in a single outfall pipe to the primary discharge point, terminating at Moynalty River.

The influent flow rates are monitored continually on site.

Preliminary treatment entails the removal of plastics and ragging from the waste stream. Screening facilities are provided for solids removal of inorganic materials (down to approx. 3mm particle size) via an 'Agisac' fine sack screening unit, sited immediately upstream of the discharge to the aeration tank. Screenings from the Agisac unit are collected in an adjacent skip.

Screened sewage flows then forward to the aeration unit.

### **Secondary Treatment**

Secondary treatment comprises a conventional extended aeration activated sludge process. A fine bubble diffused air aeration system has been installed in the aeration tank to maintain dissolved oxygen at sufficient levels. Aeration is supplied to the aeration tank via 2 no. aerating blowers. The dissolved oxygen level in the tank is continuously monitored via a submerged DO probe.

The biomass generated in the aeration process tends to readily settle out in the cylindrical clarifier tank. The secondary sludge collected in the clarifier is returned to the aeration unit via the sludge return pump chamber (Return Activated Sludge line – RAS). A smaller amount of this secondary sludge is 'wasted' and is pumped to the sludge holding tank via the surplus sludge pump chamber (Waste Activated Sludge line – WAS).

The aeration basin has been constructed to the following approximate dimensions:

Inner radius	3.80 m
Total Depth	2.80 m
Free board	0.60 m
Liquid Depth	2.20 m
Calculated surface area	45.36 m <sup>2</sup>
Calculated Volume	99.80 m <sup>3</sup>

The secondary (final) clarifier has been constructed to the following approximate dimensions:

Circumference	23.00 m
Wall thickness	0.15 m
inner radius	3.50 m
Total Depth	2.80 m
Free board	0.80 m
Liquid Depth	2.00 m
Calculated surface area	38.48 m <sup>2</sup>
Calculated Volume	76.97 m <sup>3</sup>

### ***Phosphate Reduction – Nutrient Removal***

In order to comply with requirements of the *Water Quality Standards for Phosphorus Regulations (S.I. 258/1998)* for the Moynalty River, ferric sulphate application is practiced at the plant. Ferric sulphate is dispensed from a 1000 litre tank at variable rates (related to laboratory test results). The ferric storage tank is located in the control building. The ferric sulphate is dispensed directly to the aeration unit.

### ***Treated Effluent Outfall***

Treated effluent flows by gravity via 225mm diameter pipe to the adjacent Moynalty River. Discharge of treated effluent is through a simple open-ended pipeline, terminating over the river, above the water level.

### ***Sludge Handling***

Settled sludge is drawn from the clarifier base via the surplus sludge pump chamber and sent forward for temporary storage in the sludge holding tank. As discussed above, return activated sludge (RAS) is pumped back to the aeration unit via the sludge return pump chamber. Waste sludge is pumped to the sludge holding tank at a rate, which is determined by the MLSS concentration in the aeration unit. The sludge holding tank has a capacity of approximately 27m<sup>3</sup>.

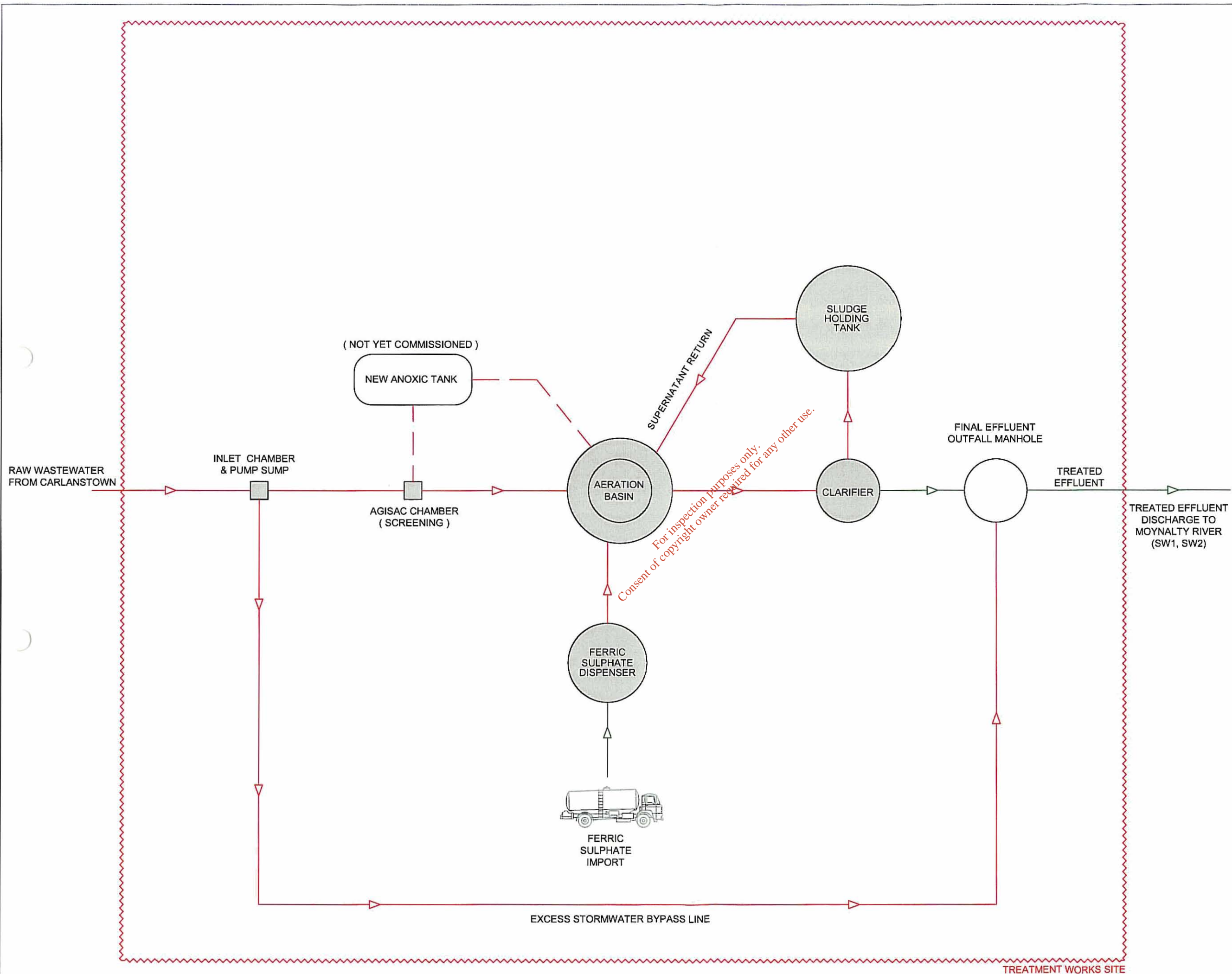
Sludge is allowed to settle in this tank and the resulting supernatant is siphoned back to the inlet pumping chamber through an overflow line. The sludge holding tank is emptied periodically by tanker, with the thickened sludge being transported to Navan Waste Water Treatment Plant for dewatering.

### ***New Anoxic Tank (Not yet commissioned)***

An anoxic tank is currently under construction on site, which will be commissioned in the near future. This will increase the levels of nitrate reduction to be achieved at the plant. Refer to Drawing No.s 5270-2788A and 2789A for location of this new unit within process.







#### NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd
A	15.06.09	ISSUE TO MEATH CO. CO.	R.K.	M.H.

Client:

MEATH COUNTY COUNCIL

Project:

CARLANSTOWN WASTE WATER  
DISCHARGE LICENCE  
APPLICATION

Title:

EXISTING PLANT/ PROCESS  
FLOW DIAGRAM

( SECTION / ATTACHMENT C.1 )

Scale @ A3: NTS

Prepared by: R.K. Checked: M.H. Date: MAY 09

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Drawing No: 5270-2789 Revision: A



## **SECTION C – INFRASTRUCTURE & OPERATION**

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### **Attachment C2: Outfall Construction & Design**

- **Outline Description of Outfall Design and Construction**
- **Drawing No. 5270-2792**
- **Drawing No. 5270-2793**

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## OUTLINE DESCRIPTION OF OUTFALL DESIGN AND CONSTRUCTION

### **1.0 PRIMARY DISCHARGE POINT**

**Location:** SW1 – Carlanstown WWTP, Carlanstown, County Meath  
276742E, 279164N

**Receiving Water:** Discharge to Moynalty River

**Originates:** Final treated effluent from Carlanstown WWTP

**Invert Level:** no data available

**Pipe Size:** 225mm diameter gravity pipeline from WWTP

**Design Criteria:** Continuous flow of treated effluent from WWTP

**Construction Detail:** Simple open-ended outfall pipe discharging to river channel

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## **2.0 SECONDARY DISCHARGE POINTS**

There are no pumping stations on the Carlanstown Sewerage Scheme. In addition there are no emergency or occasional discharge points from any other structure on the network. The sewerage network was recently upgraded and is a separate foul water system.

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### 3.0 STORM WATER OVERFLOW DISCHARGE POINTS

**Location:** SW2 – Carlanstown WWTP, Carlanstown, County Meath  
276742E, 279164N

**Receiving Water:** Discharge to Moynalty River

**Originates:** Storm water overflow from inlet pumping station sump at Carlanstown WWTP

**Invert Level:** no data available

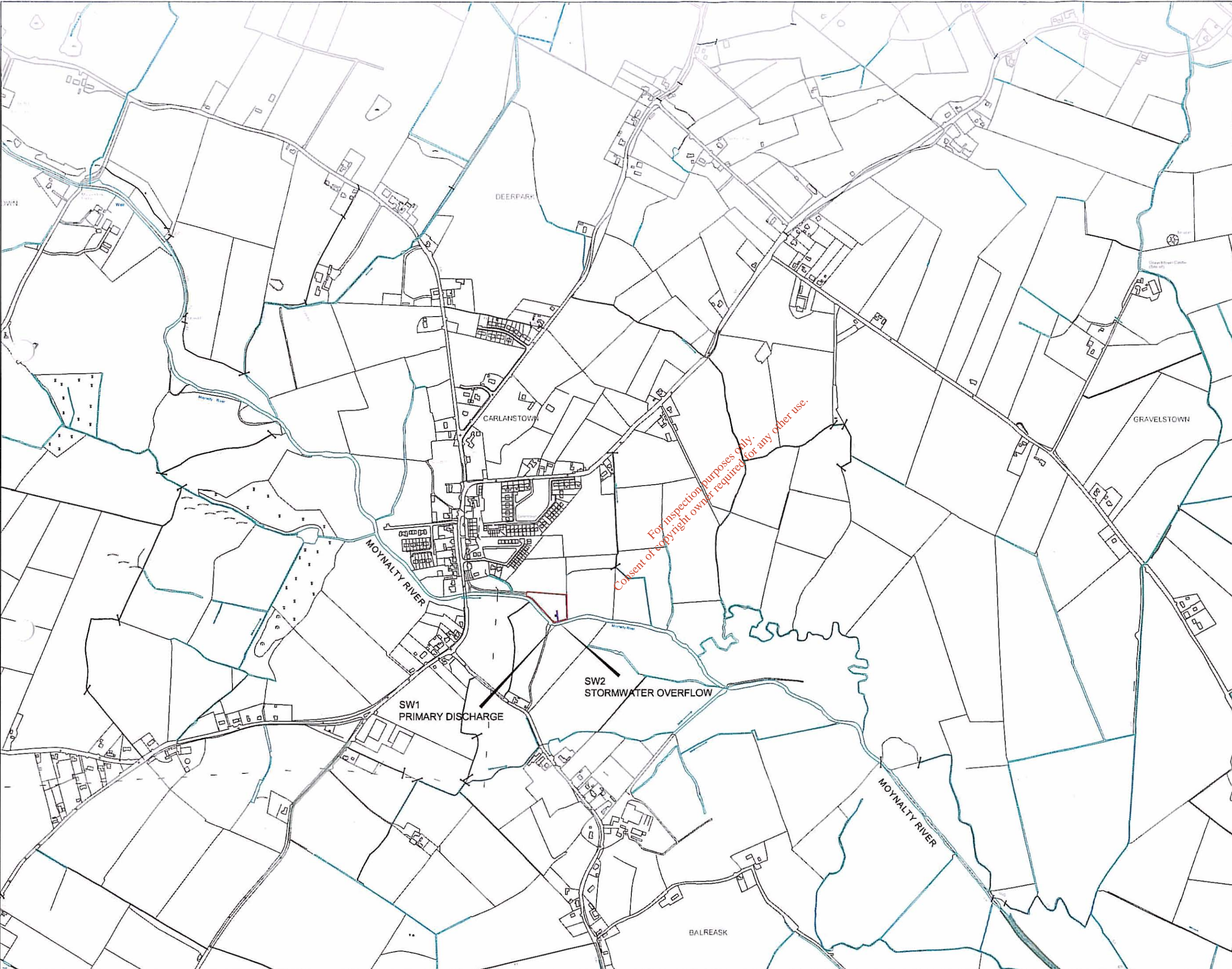
**Pipe Size:** 225mm diameter gravity pipeline (shared with SW1 – Primary Discharge)


**Design Criteria:** Storm water control has been designed such that 3 DWF immediately flows forward to secondary treatment. Flows in excess of 3 DWF are diverted to the storm water overflow line. A facility is available for excess storm water to bypass the works and discharge directly to the treated effluent manhole and on to the receiving waters via a closed pipeline. (Carlanstown sewerage network comprises a separate foul system, therefore storm water from the paved areas in Carlanstown is not diverted to the waste water treatment plant).

**Construction Detail:** Simple open-ended outfall pipe discharging to river channel

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WWTp SITE BOUNDARY

PRIMARY DISCHARGE

STORMWATER OVERFLOW

NOTES

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Rev	Date	Description	By	Chd
A	18.06.00	ISSUE TO MEATH CO. CO.	R.K.	M.H.

Client:

MEATH COUNTY COUNCIL

Project:

CARLANSTOWN WASTE WATER DISCHARGE LICENCE APPLICATION

Title:


PRIMARY DISCHARGE POINT & STORMWATER OVERFLOW LAYOUT/ LOCATION PLAN

( SECTION / ATTACHMENT C.2 )

Scale @ A3: 1 : 10,000

Prepared by:	Checked:	Date:
R.K.	M.H.	MAY 09

Project Director: M.F.G.



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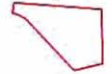
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Drawing No.:	5270-2792	Revision:	A
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LEGEND



WWTP SITE  
BOUNDARY



PRIMARY  
DISCHARGE



STORMWATER  
OVERFLOW

NOTES

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A	15.05.09	ISSUE TO MEATH CO. CO.	R.K.	M.H.

Client:

MEATH COUNTY COUNCIL

Project:

CARLANSTOWN WASTE WATER  
DISCHARGE LICENCE  
APPLICATION

Title:

PRIMARY DISCHARGE POINT (SW1)  
& STORMWATER OVERFLOW (SW2)  
CONSTRUCTION & DESIGN

( SECTION / ATTACHMENT C.2 )

Scale @ A3: 1 : 1000

Prepared by: R.K. Checked: M.H. Date: MAY 09

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Drawing No.: 5270-2793 A